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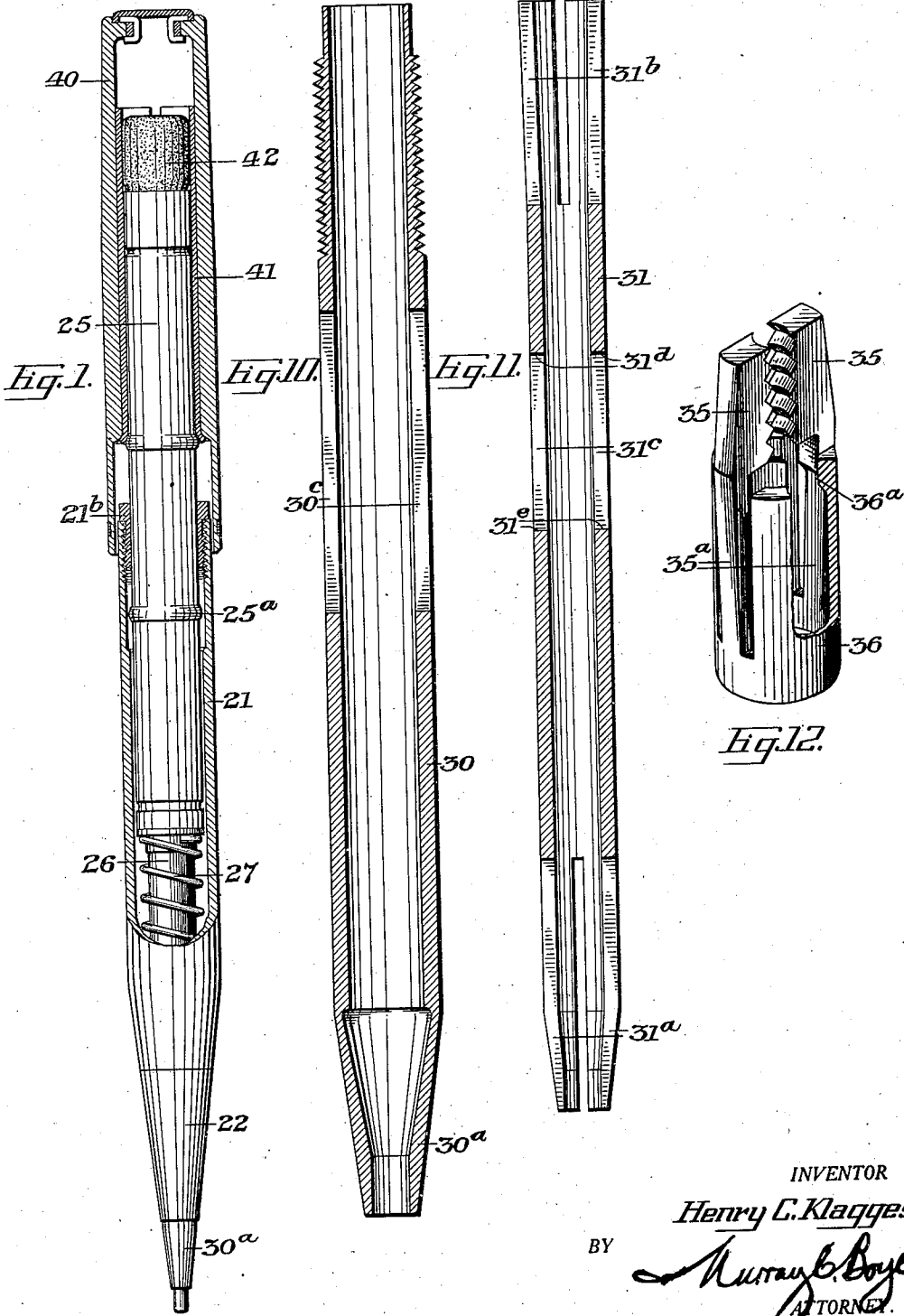
H. C. KLAGGES

2,216,780

MECHANICAL PENCIL

Filed Nov. 18, 1937

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

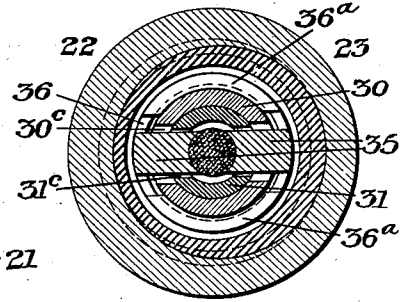
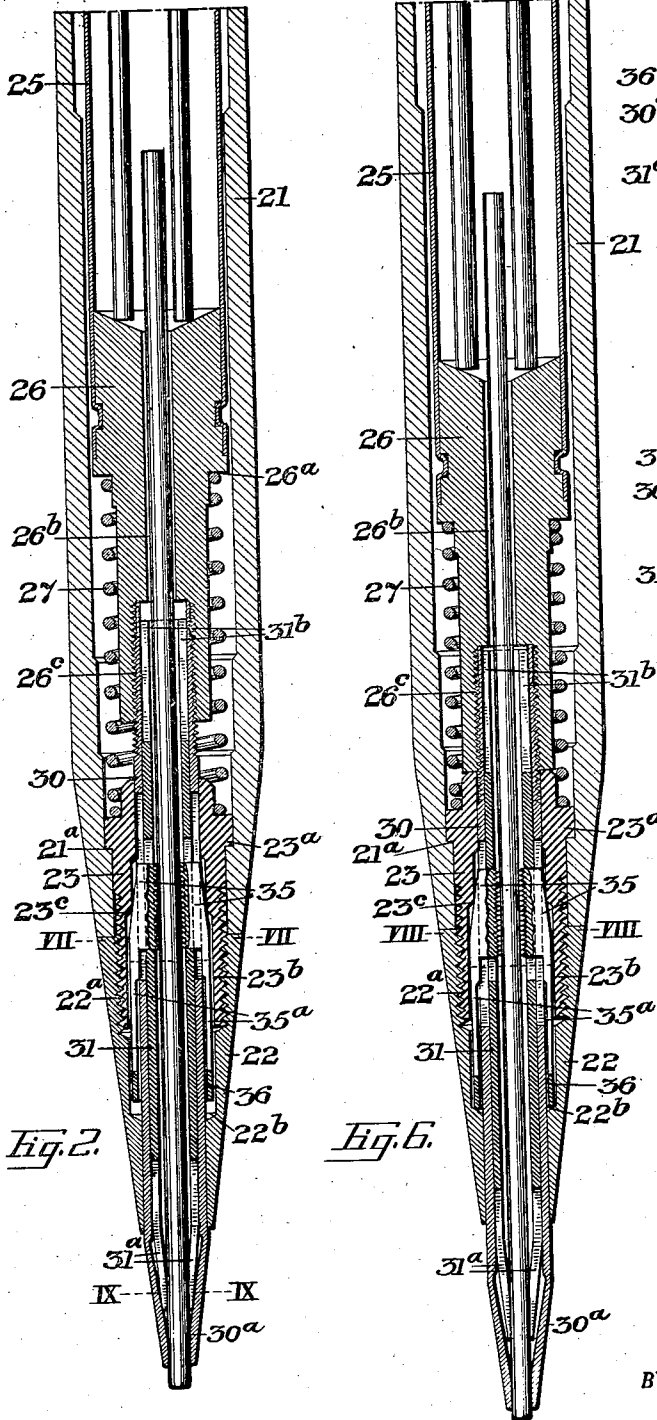


Fig. 7.

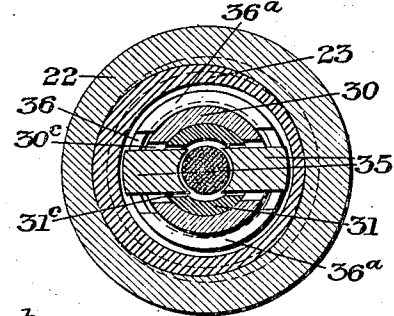


Fig. 8.

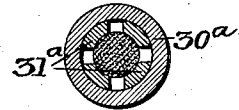


Fig. 9.

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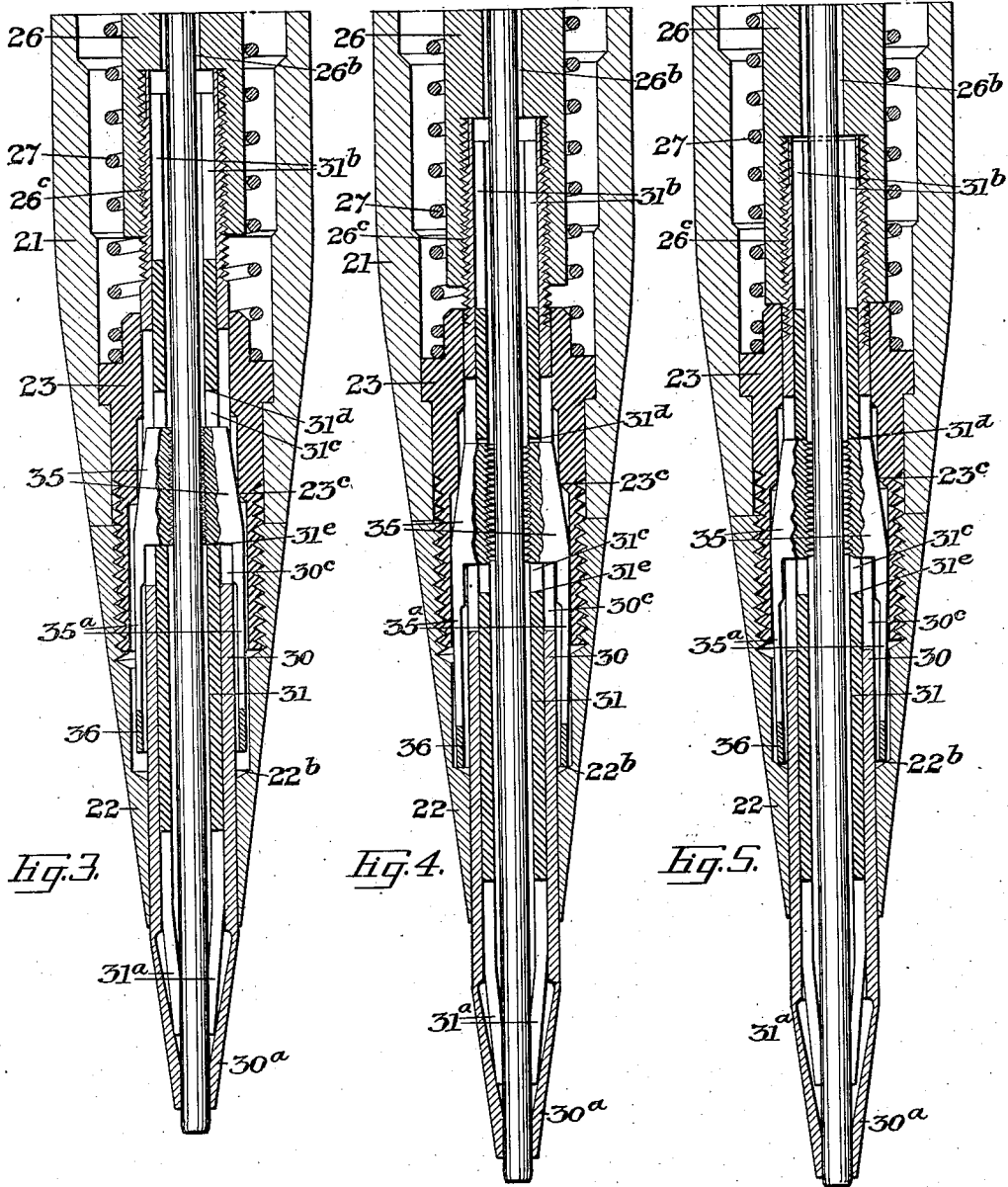
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MECHANICAL PENCIL

Filed Nov. 18, 1937

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE

2,216,780

## MECHANICAL PENCIL

Henry C. Klagges, Collingswood, N. J., assignor  
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Co., Camden, N. J., a corporation of New Jersey

Application November 18, 1937, Serial No. 175,337

16 Claims. (Cl. 120—17)

My invention relates to mechanical pencils of the type in which leads, usually of appreciable length, are automatically fed from a self-contained reservoir into a tubular element, or lead guide, which may be centrally disposed, and are advanced to writing position through said tubular element or lead guide in what may be termed step-by-step operations of a movable member operatively associated with means within the pencil casing and cooperating with said tubular element through which the lead is fed.

One object of my invention is to provide simple and efficient mechanism for advancing the lead to writing position and for locking the lead when so positioned.

A further object of my invention is to provide a mechanical pencil of the above type with mechanism adapted to cooperate with the lead adjacent the forward or writing end thereof whereby the lead may be intermittently propelled or advanced, and mechanism cooperating with the lead at another point for clamping the same after it has been projected to proper writing position.

A further object of my invention is to provide a lead propelling mechanism for pencils wherein the means serving to advance the lead includes a pair of tubular elements concentrically arranged with respect to each and in close frictional engagement; each of said tubular elements having a limited movement forward and backward toward and from the writing end of the pencil, and one of said tubular elements having slight movement independently of the other, and wherein devices are provided so that when said tubular lead feeding means moves forward the lead will be moved forward therewith, and when said tubular feeding means retracts or is moved backward, the lead will be held against such retractive movement and in the desired writing position.

A further object of my invention is to provide lead feeding means of the above described type wherein friction devices for clamping the lead are associated with the lead-feeding means and are caused by the movement of the lead-feeding means to move alternately to lead-gripping and releasing positions.

A further object of my invention is to provide a mechanical pencil in which a storage chamber for the leads is part of the operating means and in which a continuous passage extends between such storage chamber and the writing end of the pencil, with an internal frictionally mounted tube for passage of the leads; such internal tube being movable with the tube carried by the storage chamber to advance the lead; cooperating

with such latter tube to clamp the lead in writing position, and cooperating with clamping jaws to insure their gripping engagement with the lead at a point above the writing end of the pencil.

A further object of my invention is to provide a pencil of the above type with mechanism including a pair of concentrically arranged reciprocable sleeves or tubes through the central one of which the lead is passed and by which the lead is frictionally gripped at all times and when at rest is further gripped by wedging means, with means for reciprocating the sleeves or tubes and for effecting movement of one with respect to the other, and with clutching jaws so mounted as to be frictionally actuated by the reciprocative movement of the outer sleeve or tube; such jaws engaging and holding the lead from movement with the sleeves when the latter are retracted, and wherein said jaws are automatically disengaged from the lead when movement is imparted to the sleeves to advance a lead.

A still further object of my invention is to provide a pencil of the above-mentioned type wherein one of said concentric sleeves or tubes, the inner one, is provided with means for gripping the lead at all times; to provide means, when said sleeve is at one extreme end of one of its reciprocative movements, to wit: in writing position, to further grip the lead, and further to provide means to retard the forward movement of said inner tube or sleeve with respect to the outer tube or sleeve.

These and other features of my invention are more fully described hereinafter; reference being had to the accompanying drawings, more or less diagrammatic in character, in which:

Figure 1 is a view in elevation, partly in section, of a mechanical pencil within the scope of my invention.

Fig. 2 is a sectional elevation, on a larger scale, of the forward or writing end of my improved pencil, sufficient to illustrate the lead-feeding and lead-arresting mechanism; the parts being shown in the position of use with the lead in writing position.

Figs. 3, 4 and 5 are diagrammatic views, on a still larger scale, showing steps in the operation of advancing or feeding the lead.

Fig. 6 is a sectional view similar to Fig. 2 and on the same scale, showing the parts in the advanced position at the end of the lead-feeding movement and before retraction of the parts to leave the lead in the writing position.

Fig. 7 is a cross-sectional view on the line VII—VII, Fig. 2.

Figs. 8 and 9 are cross sectional views on the lines VIII—VIII and IX—IX, Figs. 6 and 2, respectively.

5 Figs. 10 and 11 are longitudinal sectional views of the concentrically arranged lead advancing tubes or sleeves, in separated condition, and

Fig. 12 is a detached perspective view, partly in section, of the sleeve carrying the lead-arresting and clamping jaws or dogs.

10 The pencil structure includes a casing in which the mechanism is housed; a tubular cap for imparting reciprocative movement to such mechanism and a tip which, in addition to providing the conventional finish for the writing end of the pencil serves to retain the mechanism within the casing.

The tip at the writing end of the pencil casing is tapered and has an opening through which the concentrically arranged lead-carrying tubes or sleeves project; only one of said tubes being visible and such tube having an outer tapered end which conforms to the taper of the tip, and having an internally tapered wall which may have a different angle. Within the outer tube or sleeve I provide an inner tube or sleeve with a tapered and split end, and the lead passes through this inner tube and its split end; the outer tapered portion of the latter having wedging engagement with the inner tapered surface of the outer tube. Means are provided for forcing the split end of the inner tube or sleeve against the inner tapered wall of the outer projectible tube or sleeve and by such arrangement the split end of the inner sleeve is caused to grip and hold the lead with respect to the outer tube and in writing position. The outer tube or sleeve is attached to a member which is capable of end-wise movement within the pencil casing while the inner tube or sleeve frictionally engages the outer tube or sleeve. This movable member has a passage therethrough leading from the magazine or reservoir in which the leads are stored; such passage being aligned with that of the inner tube or sleeve into which such leads pass. The inner sleeve or tube is in frictional engagement with the outer sleeve or tube and such engagement may be increased at its inner end by slitting the same and outwardly expanding the wall portions between such slits. It is also provided with means for frictionally gripping the forward end of the lead, so that when the inner and outer tubes or sleeves are moved forward the lead, through the frictional engagement therewith, will be moved forward and, with both inner and outer tubes or sleeves, projected through the tapered tip at the end of the pencil. After the lead is so projected and the tubes or sleeves retract, the inner split tube clamps the lead and holds it in writing position. Associated with the pair of concentrically arranged tubes or sleeves are gripping or clamping means which serve to clamp or grip the lead and hold it in the advanced position after the tubes or sleeves start to retract, so that in such retractive movement the inner sleeve or tube can move along the lead to permit its split end to get a new frictional grip thereon whereby, when the concentrically arranged tubes or sleeves are again moved forward, an additional portion of lead will be carried with them and together projected from the tapered end of the pencil casing.

In the pencil mechanism illustrated in the drawings, 21 represents the outer shell or casing, and 22 the tapered tip at the end of the same; such tapered tip end being threaded at 22<sup>a</sup> for en-

agement with a tubular element 23 having a shoulder 23<sup>a</sup> which engages a seat 21<sup>a</sup> within the end of the casing, and the tubular element 23 having a threaded projecting end 23<sup>b</sup> to which the threaded portion 22<sup>a</sup> of the tapered tip 22 of the pencil is secured.

Within the pencil casing I provide a shell 25, which provides a lead reservoir and may be connected in any suitable manner with a tubular member 26 at its lower end, and between a shoulder 26<sup>a</sup> of said element 26 and the member 23 at the lower end of the casing, a coiled expansion spring 27 is arranged. The shell 25 may be provided with a shoulder 25<sup>a</sup>, and a screwing 21<sup>b</sup> adapted to the pencil casing serves to position said shell 25 centrally within the outer casing 21 during movements against the tension of the coiled spring 27.

The tubular member 26 which forms the bottom of the lead reservoir is provided with a plurality of bores indicated at 26<sup>b</sup> and 26<sup>c</sup>; the bore 26<sup>b</sup> forming part of the lead guide while the lower bore 26<sup>c</sup> is larger and may be internally threaded for the reception of the threaded end of a sleeve or tube 30, which extends to and through the tapered tip 22, and whose outer end is preferably tapered at the same angle as said tip. In lieu of a threaded connection for these parts, they may be secured together by a force fit, or otherwise.

Concentrically mounted with respect to the outer tube or sleeve 30, is an inner tube or sleeve 31, which may be said to float within said outer tube or sleeve; said inner tube having both ends split to provide fingers and providing a continuation of the lead guide 25<sup>b</sup> of the member 25. The lower split end of the internal sleeve or tube 31, indicated at 31<sup>a</sup>, is slightly tapered and lies in engagement with the inner tapered wall of the end of the outer sleeve or tube 30, when the parts are in the writing position. The fingers at the upper split end of the inner tube or sleeve 31, indicated at 31<sup>b</sup>, may be expanded to a slight extent, as indicated in Fig. 11, to increase or insure frictional engagement with the inner surface of the outer tube or sleeve 30.

The tubular member 23 is bored, preferably centrally of the same, for the passage of the sleeves or tubes 30 and 31, and this member is additionally bored to provide an internal annular shoulder 23<sup>c</sup> to form camming contact with the beveled outer surfaces of a pair of resilient clamping or gripping jaws or dogs 35, carried by spring fingers 35<sup>a</sup> forming part of a sleeve 36 which surrounds the outer sleeve or tube 30; such jaws being positioned so as to automatically spring apart when released from camming contact with said shoulder 23<sup>c</sup>. The sleeve 36 is internally bored in two diameters; the larger bore providing the spring fingers carrying the jaws or dogs 35, 60 and a slightly smaller bore forming walls 36<sup>a</sup> flanking the spring fingers, which walls are in frictional engagement with said outer tube or sleeve 30 so that when the latter is moved, the sleeve 36 moves with it. Additionally, the inner surfaces of the gripping jaws or dogs may be notched for better engagement with the lead when brought into engagement with the same to arrest its rearward movement as the tubes 30 and 31 are retracted by the spring 27 upon release of pressure upon the means serving to impart longitudinal movement to the internally disposed operating mechanism.

The tip 22 is provided with an internal shoulder 22<sup>b</sup> which serves as an abutment to limit move-

ment of the sleeve 36 in one direction, that is to say, when the internal operating mechanism is advanced to move the tubes 30 and 31, and whereby the lead may be carried forward by the inner sleeve or tube 31, said sleeve 36 moves with the outer tube 30 until its movement is arrested by the shoulder 22<sup>b</sup>, while the outer tube 30 with the internal tube 31 continue movement to their limit.

The tubes 30 and 31 are slotted at 30<sup>c</sup> and 31<sup>c</sup>, respectively, for the gripping jaws 35; the slots of the inner tube 31 having squared upper ends 31<sup>d</sup> to engage the upper ends of said jaws which thereby serve as abutments to limit the movement of the inner tube, and when this stage is reached, the inner tube halts while the outer tube continues its limited movement. In the present instance the lower reduced end 26<sup>c</sup> of the tubular member 26 engages the reduced upper end 23<sup>d</sup> of the tubular member 23, thus avoiding pressure on the inner tube and all danger of deforming the spring fingers carrying the jaws 35. This extra movement of the outer tube with respect to the inner tube is slight and its extent is indicated in Figs. 5 and 6, wherein it will be noted that its outer tapered end 30<sup>a</sup> has moved beyond the clamping fingers at the end 31<sup>a</sup> of the inner tube 31; the engagement of the same with the lead halting the latter in the position indicated.

The upper end of the reservoir shell 25 is preferably enclosed by a tubular cap or member 40 which serves as the operating element and when of composition material it may have an inner liner or sleeve of metal, as indicated at 41, to insure proper engagement with the upper end of the reservoir shell. This shell may carry a plug forming a closure for the lead reservoir, and such plug may carry an eraser, indicated at 42.

#### *Operation of pencil to effect feeding of the lead*

Considering the lead actuating mechanism in the position indicated in Figs. 2 and 3, where the lead is in the writing position, it will be observed that, as the outer tube 30 is positively connected with the tubular member 23 forming the bottom of the lead reservoir, the retracted position of said member under the influence of the coiled spring 27, holds said tube 30 in the retracted position, with its internal tapered end wall in engagement with the tapered portion of the split end 31<sup>a</sup> of the inner tube 31 which, in turn, has the lower end walls 31<sup>e</sup> of its slots 31<sup>c</sup> in engagement with the under side of the gripping jaws 35 which, in turn, have their cam faces engaged by the shoulder 23<sup>c</sup> of the intermediate bore of the member 23 mounted in the lower part of the pencil casing. It will be apparent, therefore, that the lead is now held between the confining jaws at the end 31<sup>a</sup> of the inner tube or sleeve 31 and by the gripping jaws 35 and, by reason of the fact that the cam faces of the gripping jaws and the cam faces of the inner tapered surface at the end of the outer tube or sleeve 30 are at the same angle, there is no unequal pressure upon the lead and it is held at the separated points indicated.

As noted, the rear or upper end of the inner tube or sleeve 31 is in close frictional engagement with the inner end of the outer tube 30 fixed to the member 26, hence, in the initial movement of said member 26 and the outer tube 30, the inner tube 31 moves with said outer tube without change in their relative position; a condition indicated in Fig. 4, and the position of these tubes with respect to each other is the same at the end of such partial movement as it is when the lead is in the writing position as indicated in Figs. 2

and 3. In like manner, the sleeve 36 carrying the gripping jaws 35 is in frictional engagement with the outer tube 30 and moves with it and by reason of the resiliency of said jaws and their inherent tendency to spring outwardly, their longitudinal movement with the tube 30 carries them away from engagement with the shoulder 23<sup>c</sup> of the member 23; thereby releasing the lead which is carried forward by the clamping jaws at the forward end 31<sup>a</sup> of the inner tube or sleeve 31.

Upon further movement of the actuating mechanism, the lower end of the sleeve 36 comes to rest against the abutment formed by the shoulder 22<sup>b</sup> in the tip 22, and upon still further movement, the inner or upper end walls 31<sup>d</sup> of the slots 31<sup>c</sup> of the inner tube 31 engage the upper ends of the fingers 35, thereby arresting the movement of the inner tube and the lead frictionally held in the tapered split end 31<sup>a</sup> of the same. Continued movement of the actuating mechanism moves the outer tube 30 with relation to the arrested inner tube 31; such movement carrying the tapered inner wall of said outer tube out of engagement with the tapered end 31<sup>a</sup> of the inner tube, and now the lead is held by the inwardly flexed jaws at such end only, at the termination of one complete forward movement of the actuating mechanism.

From the foregoing description, therefore, it will be seen that in the initial part of the movement for effecting feed of the lead, the outer tube 30; the inner tube 31; the lead, and the sleeve 36 carrying the gripping jaws 35, move together for a short period; then, as the operative movement continues, the motion of the sleeve 36 is arrested by the abutment formed by the shoulder 22<sup>b</sup> in the tip 22; and following this the motion of the inner tube and the lead stops while the movement of the outer tube continues to a predetermined stop. Upon release of the actuating mechanism and its retraction by the spring 27, the sleeve 36 carrying the jaws 35 is carried back by its frictional engagement with the outer tube 30 which brings said jaws into engagement with the shoulder 23<sup>c</sup> of the member 23; such engagement causing said jaws to move into gripping contact with the lead and arrest its movement. As the retractive movement continues, the outer tube 30 carries the inner tube 31 back or inwardly by reason of its frictional engagement therewith at the inner or upper end; moving the jaws at its tapered flexed end 31<sup>a</sup> over the lead; such inner tube coming to rest when the lower end walls 31<sup>e</sup> of its slots 31<sup>c</sup> abut the under surface of the gripping jaws or dogs 35. Upon further retractive movement, the outer tube 30 slides over the inner tube 31 and finally comes to rest when the internal tapered wall at the end of the same abuts the tapered end 31<sup>a</sup> of the inner tube and locks the end of the lead therein. The lead will now be in an advanced position with respect to said outer and inner tubes 30 and 31, to the extent, substantially, of the difference between the length of the gripping jaws and the length of the slots in the inner tube 31.

While I have described with some particularity a preferred embodiment of my improved pencil mechanism, it will be understood that modifications may be made therein with the scope of my invention, all of which is deemed to be within the terms of the appended claims.

I claim:

1. A mechanical pencil comprising a casing, reciprocating means associated therewith including a plurality of concentrically arranged tubes telescopically mounted and movable longitudinally of the casing for supporting and pro-

5 pelling the lead; one of said tubes being continuous with the reciprocating means and arranged for movement with respect to the other, and devices carried by the ends of said tubes for clamping said lead adjacent the writing point of the pencil when said propelling means is at one extreme end of its movement.

10 2. A mechanical pencil comprising a casing, a tapered tip at one end of the same, reciprocating means associated therewith including a plurality of concentrically arranged tubes telescopically mounted and movable longitudinally of the casing and projecting through said tip for supporting and propelling the lead; one of said tubes being continuous with the reciprocating means and arranged for movement with respect to the other, and devices carried by the ends of said tubes for clamping said lead adjacent the writing point of the pencil when said propelling means is at one extreme end of its movement.

15 3. A mechanical pencil comprising a casing, reciprocating means associated therewith including a plurality of concentrically arranged tubes telescopically mounted and movable longitudinally of the casing for supporting and propelling the lead; one of said tubes being continuous with the reciprocating means and movable with and independently of the other, and devices carried by the ends of said tubes for clamping said lead adjacent the writing point of the pencil when said propelling means is at one extreme end of its movement.

20 4. A mechanical pencil including a casing through which a section of lead is guided, a tubular member slidable within the casing and having a tapered end portion projecting through the same; said tapered end portion having a tapered bore, a tube within said first-named tubular member and forming portion of a lead passage; said internal tube having a plurality of tapered gripping fingers, means for holding said gripping fingers against the tapered bore of the first-named tubular member to grip said lead at the writing end of the pencil; said internal tube being in frictional engagement with the first-named tubular member, and means for reciprocating said tubular members.

25 5. A mechanical pencil including a casing having a tip at its lower end through which a section of lead is guided, a tubular member reciprocable within the casing and having a tapered portion projecting through said tip, said tapered portion having a tapered bore, a tube within said first-named tubular member and forming part of a lead guiding tube; said internal tube being in frictional engagement with the outer tubular member and having a plurality of tapered gripping fingers, means for holding said gripping fingers against the tapered bore of the first-named tubular member to grip said lead at the writing end of the pencil, a sleeve slidably mounted on said outer tubular member and in frictional engagement therewith; said sleeve carrying a pair of resilient gripping jaws for contact with the lead and the inner and outer tubular members being slotted for the passage of said jaws, and means for holding said jaws in engagement with the lead when the latter is projected through the internal tube and is disposed in writing position.

30 6. A mechanical pencil including a casing having a tip at its lower end through which a section of lead is guided, a tubular member reciprocable within the casing and having a tapered portion projecting through said tip; said

5 tapered portion having a tapered bore, a tube within said first-named tubular member and forming portion of a lead passage; said internal tube being in frictional engagement with the outer tubular member and having a plurality of tapered gripping fingers, means for holding said gripping fingers against the tapered bore of the first-named tubular member to grip said lead at the writing end of the pencil, a sleeve slidably mounted on said outer tubular member and in frictional engagement therewith; said sleeve carrying a pair of resilient gripping jaws for contact with the lead and the tubular members being slotted for the passage of said jaws, means for holding said jaws in engagement with the lead when the latter is disposed in writing position, and means for limiting feeding movement of said internal tube with respect to the outer tubular member.

10 7. In a mechanical pencil, the combination of 20 a casing, a tubular member fitting one end of the same and associated with a tapered tip, a reciprocable shell within the casing affording a compartment for storing leads, a tubular member carried by said shell and having a lead passage, a tube secured to the last-named tubular member and projecting through said tip, an inner tube concentrically mounted with respect to the first-named tube and providing a lead passage substantially continuous with that of the tubular member; the lower end of said inner tube being split to provide clamping fingers for the lead adjacent the writing end of the pencil and the upper end of said tube being split for frictional engagement with the inner wall of the outer tube; each of said tubes having oppositely disposed slots in their walls, resilient gripping fingers disposed in said slots adjacent to the path of the lead, a sleeve carrying said gripping fingers and in frictional engagement with the outer tube; the latter having tapered inner walls at its outer end to engage the tapered gripping fingers of the inner tube through which the lead passes and hold them in clamping engagement with the lead, resilient means for holding the parts with the lead gripped in the writing position; movement of the reciprocable shell carrying the outer tube against the action of said resilient means first effecting movement of the outer tube together with the inner tube and later effecting further movement of the outer tube in relation to the inner tube, and means effective on retraction of the outer tube to bring said resilient gripping jaws into engagement with the lead to halt the same in a projected position and permit the inner tube to ride up thereon as the concentrically arranged tubular parts are further retracted.

35 8. In a mechanical pencil, the combination of a casing, a tubular member fitting one end of the same, a tip engaging said tubular member and confining the same to the casing, a shell reciprocably mounted within the casing and affording a compartment for storing leads, a tubular member closing the end of said compartment and having a lead passage, a tube secured to said tubular member and projecting through the tip at the end of the casing, an inner tube concentrically mounted with respect to the first-mentioned tube and providing a lead passage substantially continuous with that of the tubular member; the lower end of said inner tube being split to provide clamping fingers for the lead adjacent the writing end of the pencil and the upper end of said tube being split for frictional engagement with the inner wall of the outer and

first-mentioned tube; each of said concentrically arranged tubes having oppositely disposed slots in their walls, resilient gripping fingers adapted to pass through said slots and having engaging faces adjacent to the path of the lead, a sleeve in frictional engagement with the outer tube and carrying said gripping fingers; said outer tube having tapered inner walls adjacent its outer end adapted to engage the tapered gripping fingers of the inner tube through which the lead passes and hold them in clamping engagement with the lead, a spring for holding the parts with the lead gripped in the writing position; movement of the lead-storage chamber carrying the outer tube against the action of said spring first effecting movement of the outer tube together with the inner tube and later effecting further movement of the outer tube in relation to the inner tube, means effective on retractive movement of the outer tube to bring said resilient gripping jaws into engagement with the lead to halt the same in the projected position and permit the inner tube to ride up on the same as the concentrically arranged tubular parts are retracted by the spring, and means for limiting forward movement of the sleeve carrying the gripping jaws.

9. In a mechanical pencil, the combination of a casing, a shell reciprocably mounted within the casing and affording a compartment for storing leads, a tubular member closing the end of said compartment and having a lead passage, a tube secured to said tubular member and projecting through the end of the casing, an inner tube concentrically mounted with respect to the first-mentioned tube and providing a lead passage substantially continuous with that of the tubular member; the lower end of said inner tube being split to provide clamping fingers for the lead and the upper end of said inner tube being split for frictional engagement with the inner wall of the outer and first-mentioned tube; each of said concentrically arranged tubes having oppositely disposed slots in their walls, resilient gripping fingers adapted to pass through said slots and having engaging faces adjacent to the path of the lead; a sleeve in frictional engagement with the outer tube and carrying said gripping fingers; said outer tube having tapered inner walls adjacent its outer end adapted to engage the tapered gripping fingers of the inner tube through which the lead passes and hold them in clamping engagement with the lead, a spring for holding the parts with the lead gripped in the writing position; movement of the lead-storage chamber carrying the outer tube against the action of said spring first effecting movement of the outer tube together with the inner tube and later effecting further movement of the outer tube in relation to the inner tube; and means effective on retractive movement of the outer tube to bring said resilient gripping jaws into engagement with the lead to halt the same in the projected position and permit the inner tube to ride up on the same as the concentrically arranged tubular parts are retracted by the spring, the end walls of the slots of said inner tube engaging the gripping jaws at each end of the reciprocative movements of the latter.

10. A mechanical pencil comprising a casing having an abutment adjacent the writing end of the same, a reciprocable shell forming a lead storage compartment within the casing and having a tubular extension projecting through the casing at the writing tip end of the same; said

reciprocable shell having a lead passage and the tubular extension forming in effect a continuation of said lead passage, a tube within said tubular extension for passage of the lead; said tube being capable of movement with respect to the tubular extension in frictional engagement therewith whereby joint movement of said parts may be effected by reciprocation of the shell, a spring between the casing abutment and the reciprocable shell to effect movement of the latter in one direction; movement in the opposite direction being effected manually, cooperating parts carried by the tube within the tubular extension to effect movement of the lead upon imparting movement to the shell; said parts under the influence of the spring locking the lead within the inner tube at the end of the tubular extension, and means movable with the tubular extension for holding the lead against retractive movement as the tubular extension and inner tube are retracted after the lead has been fed forward by said inner tube.

11. A mechanical pencil comprising a casing having a tubular member fitting the bore of the same adjacent the writing end thereof and forming an abutment, a reciprocable shell forming a lead storage compartment within the opposite end of the casing and having a tubular extension passing through said tubular member; said reciprocable shell having a lead passage, a tube within said tubular extension and in frictional engagement therewith whereby joint movement of said parts may be effected by reciprocation of the shell; said inner tube forming a continuation of the lead passage, a spring between the tubular member abutment fitting the bore of the casing and the reciprocable shell to effect movement of the latter in one direction; movement in the opposite direction being effected manually, cooperating tapered parts carried by the inner tube to effect movement of the lead upon imparting movement to the shell; said parts under the influence of the spring locking the lead within the tapered end of the inner tube at the end of the tubular extension which has a tapered cooperating surface and means movable with the tubular extension for holding the lead against retractive movement as the tubular extension and inner tube are retracted after the lead has been fed forward by said inner tube.

12. A mechanical pencil comprising a casing, a reciprocating member associated therewith including a plurality of concentrically arranged tubes movable longitudinally of the casing under the influence of said reciprocating member for supporting and propelling the lead; one of said tubes being connected to the reciprocating member for direct movement thereby and the other being disposed internally of the first-mentioned tube and having movement with and independently thereof, and cooperative means carried by said tubes for clamping the lead adjacent to the writing point thereof when said propelling means is at one extreme end of its movement.

13. A mechanical pencil comprising a casing, a reciprocating member associated therewith including a plurality of concentrically arranged tubes movable longitudinally of the casing under the influence of said reciprocating member for supporting and propelling the lead; one of said tubes being connected to the reciprocating member for direct movement thereby and the other being disposed internally of the first-mentioned tube and having movement with and independently thereof, cooperative means carried by said



tubes for clamping the lead adjacent to the writing point thereof when said propelling means is at one extreme end of its movement; said propelling means being manually actuated in one direction, and a spring for returning said propelling means and causing the cooperative tube parts to grip the lead.

14. A mechanical pencil comprising a casing, a reciprocating member associated therewith including a plurality of concentrically arranged tubes movable longitudinally of the casing under the influence of said reciprocating member for supporting and propelling the lead; one of said tubes being connected to the reciprocating member for direct movement thereby and the other being disposed internally of the first-mentioned tube and having movement with and independently thereof, cooperative means carried by said tubes for clamping the lead adjacent to the writing point thereof when said propelling means is at one extreme end of its movement, and a sleeve slidably mounted on the tube connected to the reciprocating member and in frictional engagement therewith; said sleeve carrying a pair of resilient gripping jaws for contact with the lead and the inner and outer tubes being slotted for the passage of said jaws.

15. A mechanical pencil comprising a casing, a reciprocating member associated therewith including a plurality of concentrically arranged tubes movable longitudinally of the casing under the influence of said reciprocating member for supporting and propelling the lead; one of said tubes being connected to the reciprocating member for direct movement thereby and the other

being disposed internally of the first-mentioned tube and having movement with and independently thereof, cooperative means carried by said tubes for clamping the lead adjacent to the writing point thereof when said propelling means is at one extreme end of its movement, a sleeve slidably mounted on the tube connected to the reciprocating member and in frictional engagement therewith; said sleeve carrying a pair of resilient gripping jaws for contact with the lead at a point remote from the writing tip end of the pencil and the inner and outer tubes being slotted for the passage of said jaws; said lead-propelling means being manually actuated in one direction, and a spring for returning said propelling means and causing the cooperative tube parts and said gripping jaws to grip the lead; the engagement by said jaws being in advance of the clamping action of the cooperating tube parts.

16. A mechanical pencil comprising a casing, reciprocating means associated therewith including a plurality of concentrically arranged tubes telescopically mounted and movable longitudinally of the casing for supporting and propelling the lead; one of said tubes being continuous with the reciprocating means and movable with and independently of the other, and cooperative devices carried by the ends of said tubes for clamping the lead adjacent the writing point of the pencil when said propelling means is at one extreme end of its movement; the devices of the inner tube maintaining constant frictional engagement with the lead.

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